BIOLOGICAL ASSESSMENT FOR ATLANTIC SALMON, AND ATLANTIC AND SHORTNOSE STURGEONS IN MAINE:

An evaluation of the potential effects of federally promulgated aquatic life criteria

U.S. Environmental Protection Agency

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Introduction

Federally protected species are listed as endangered or threatened under the Endangered Species Act (ESA). Section 7(a) of the Endangered Species Act of 1973 (ESA), as amended, grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with, and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

The Environmental Protection Agency (EPA) has proposed federal Clean Water Act (CWA) water quality standards (WQS) that, when promulgated, would apply to waters under the state of Maine's jurisdiction. The proposed WQS can be found at the following link: https://www.federalregister.gov/articles/2016/04/20/2016-09025/proposal-of-certain-federal-water-quality-standards-applicable-to-maine. While the majority of the proposed WQS are to protect the health of Maine tribal members engaging in sustenance fishing, some will protect aquatic life in waters in Indian lands and throughout the state. EPA proposed the WQS to address various disapprovals of Maine's standards that EPA issued in February, March, and June 2015. The proposed WQS discussed below take into account the best available science, including local and regional information, as well as applicable EPA policies, guidance, and legal requirements, to protect aquatic life.

The purpose of this Biological Assessment (BA) is to evaluate the potential effects that the proposed aquatic life criteria may have on federally protected species, specifically the Atlantic salmon (*Salmo salar*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon, (*A. brevirostrum*). This BA addresses the proposed action in compliance with Section 7(c) of the ESA of 1973, as amended. Section 7 of the ESA assures that, through consultation (or conferencing for proposed species) with the USFWS and NMFS, federal actions do not jeopardize the continued existence of any threatened, endangered or proposed species, or result in the destruction or adverse modification of critical habitat. Based on the discussion below, EPA believes that promulgation of the aquatic life criteria is unlikely to adversely affect the three listed species or the Critical Habitat for Atlantic salmon or proposed Critical Habitat for Atlantic sturgeon.

Project Description

Background

In decisions issued in February, March, and June 2015, EPA disapproved a number of Maine WQS that were not adequately protective of human health or aquatic life. The CWA requires EPA to promptly propose, and ninety days thereafter to promulgate federal WQS to remedy such disapprovals unless the state adopts and EPA approves protective WQS.

The disapprovals of ME WQS for aquatic life primarily applied to waters in Indian lands[1]; however, one applied to all Maine waters. For waters in Indian lands, EPA proposed criteria for tidal temperature, freshwater pH, and freshwater ammonia; and a mixing zone policy.[2] On a statewide basis, including Indian lands, EPA proposed dissolved oxygen criteria for Class A waters.[3] The following section discusses the disapprovals and the WQS that EPA proposed and intends to promulgate for aquatic life protection.

Ammonia Criteria for Fresh Waters in Indian Lands

On March 16, 2015, EPA disapproved the ammonia criteria for the protection of aquatic life for fresh waters in Indian lands. The criteria are set forth in DEP Rule Chapter 584, Appendix A. EPA's disapproval was based on a review of whether the criteria protect the applicable designated uses and are based on sound scientific rationale. EPA revised its CWA Section 304(a) recommended ammonia criteria for fresh waters in August 2013 and incorporated the latest science for freshwater mussels and snails, which are sensitive to ammonia toxicity (USEPA 2013). This science was not included in EPA's 1999 ammonia criteria recommendations, on which Maine's criteria are based. Therefore, EPA concluded that Maine's criteria are not protective of the designated use because they are not protective of freshwater mussels and snails and, accordingly, disapproved the criteria.

EPA proposed ammonia criteria for fresh waters in Indian lands based on the 2013 updated 304(a) recommended ammonia criteria. The acute and chronic criteria concentrations in EPA's 2013 update are expressed as functions of temperature and pH, so the applicable criteria vary by waterbody, depending on the temperature and pH of the receiving waters. The criteria document describes the relationship between ammonia and these water quality factors and provides tables showing how the criteria values change with varying pH and temperatures. EPA's proposed criteria include tables that contain Criterion Maximum Concentrations (CMC) and Criterion Continuous Concentrations (CCC) that correspond to a range of temperatures and pH values, and require that the applicable CMCs and CCCs shall not be exceeded. In addition, consistent with EPA's recommended criteria, the proposed criteria include a requirement that the highest four-day average within the same 30-day period used to determine compliance with the CCC shall not exceed 2.5 times the CCC, more than once every three years. For the reasons explained in EPA's 304(a) criteria recommendations for ammonia, EPA's proposed criteria are protective of the designated aquatic life use and based on sound science.

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[1] For the purpose of this BA, and in accordance with the proposed rulemaking, "waters in Indian lands" are those waters in the tribes' reservations and trust lands as provided for in state and federal settlement acts that resolved the tribes' land claims in Maine.

[2] It was not until the February 2015 decision that EPA concluded that Maine has the authority to adopt WQS for waters in Indian lands in Maine. Because EPA had never previously acted on any Maine WQS for waters in Indian lands, they remained ''new or revised'' WQS as to those waters, even though EPA had approved many of them for other state waters. They were therefore subject to EPA review and approval or disapproval pursuant to CWA section 303(c).

[3] EPA had never previously approved or disapproved the Class A DO criteria for any waters in Maine.

pH Criterion for Fresh Waters in Indian Lands

Maine's freshwater pH criterion in 38 M.R.S. § 464(4.A(5)) prohibits discharges from causing the pH of receiving waters to fall outside the range of 6.0 to 8.5. On June 5, 2015, EPA disapproved the pH criterion for fresh waters in Indian lands because the lower end of the range (6.0) is not protective of aquatic life uses.

EPA proposed a pH criterion with a range of 6.5 to 8.5. The proposal is based on the lower value of EPA's recommended pH criterion (6.5 to 9.0) to protect freshwater fish and bottom-dwelling invertebrates that provide food for freshwater fish. In waters that are more acidic than 6.5, the likelihood of harm to aquatic species increases when periodic acidic inputs (either natural or anthropogenic in origin) liberate CO_2 from bicarbonate in the water leading to direct lethality as a result of lack of oxygen, or causing a further drop in pH into potentially lethal ranges. Fish suffer adverse physiological effects increasing in severity as the degree of acidification increases, until lethal levels are reached. Therefore, EPA proposed that the pH of fresh waters in Indian lands in Maine shall not fall below 6.5. EPA included in the proposal Maine's existing value of 8.5 for the upper end of the pH range because it is within the range of 6.5 to 9.0 that EPA recommends in order to protect aquatic species from extreme pH conditions.

Temperature Criteria for Tidal Waters in Indian Lands

On June 5, 2015, EPA disapproved Maine's tidal temperature criteria in DEP Rule Chapter 582(5), for tidal waters in Indian lands (specifically, the intertidal zone at the Passamaquoddy reservation at Pleasant Point), because they are not protective of aquatic life uses. The criteria allow a 4° F monthly average rise in ambient temperatures from individual dischargers from September 2 to May 30, and a 1.5° F monthly average rise from June 1 to September 1, as measured outside of any mixing zone; they also allow a maximum temperature of 85° F as measured outside of any mixing zone. EPA disapproved the criteria because the 4° F temperature rise provision and the maximum temperature criterion of 85° F are not protective of indigenous species that have been associated with tidal waters in the vicinity of Pleasant Point, where typical temperatures are in the 37°–52° F (2.8 – 11.1° C) range based on the nearest NOAA monitoring station at Eastport, Maine.

In order to assure protection of the indigenous marine community characteristic of tidal waters in Indian lands in Maine – i.e., the intertidal zone at Pleasant Point – EPA proposed criteria consistent with EPA's 304(a) recommended criteria for tidal waters (USEPA 1986). Specifically, EPA proposed a summer weekly maximum temperature of 18°C (64.4°F), and a maximum increase in the weekly average baseline ambient temperature resulting from artificial sources of 1° C (1.8° F) during all seasons of the year, provided that the summer maximum temperature is not exceeded. The proposal specifies that the weekly average baseline thermal condition must be calculated using the daily maxima averaged over a 7-day period, and must be measured at or modeled from a reference site where there is no unnatural thermal addition from any source, and which is in reasonable proximity to the thermal discharge (within five miles) and which has similar hydrography to that of the receiving waters at the discharge. Further, EPA proposed that daily temperature cycles characteristic of the waterbody shall not be altered in either amplitude or frequency (USEPA 1986).

The natural temperature fluctuation provision in the proposed rule is necessary to induce and protect the reproductive cycles of aquatic organisms and to regulate other life factors. Since aquatic organisms are essentially poikilotherms (cold blooded), the temperature of the water regulates their metabolism and ability to survive and reproduce effectively. In addition, natural temperature fluctuations are essential to maintain the existing community structure and the geographic distribution of species (USEPA 1986).

In intertidal waters, elevated temperatures affect periphyton, benthic invertebrates, and fish, in addition to causing shifts in the dominant primary producers. Community balance can be influenced strongly by temperature-dependent factors, including: rates of reproduction, recruitment, and growth of each component population—all of which were considered in deriving all components of the proposed temperature criteria. A few degrees elevation in average monthly temperature can appreciably alter a community through changes in interspecies relationships (USEPA 1986).

The intertidal zone at Pleasant Point is home to indigenous species such as juvenile and adult, pollock, haddock, juvenile flounder, juvenile and adult shad, cod, alewife, and blueback herring, as well as various species of clams, crabs, urchins and lobsters found in the vicinity of these waters (personal communication with Dr. Theo Willis, University of Southern Maine and Dr. Robert Stephenson, St. Andrews Biological Station, St. Andrews NB, 2016).

Pollock are indigenous fish that inhabit the subtidal and intertidal zones of the Gulf of Maine (USEPA 1986). Within the subtidal and intertidal zones, pollock move to different locations depending on the temperature conditions (USEPA 1986). Pollock are abundant in the intertidal zone in the summer and fall months, and as such, are an appropriate sensitive, indigenous species by which to set a summer maximum temperature criterion (Cargnelli et al. 1999). EPA proposed a summer weekly maximum of 18° C (64.4° F), which is consistent with EPA's Gold Book methodology and is the value identified in the scientific literature that is protective of juvenile pollock (*Pollachius virens*).

The summer maximum of 18°C (64.4°F) is a weekly average value, and it is to be calculated using the daily maxima averaged over a 7-day period, similar to the calculation of the baseline ambient temperature. EPA uses a weekly average maximum temperature because, as explained in EPA Region 10 guidance, "it describes the maximum temperatures…but is not overly influenced by the maximum temperature of a single day. Thus it reflects an average of maximum temperatures that fish are exposed to over a week-long period." (US EPA 2003).

Collectively, the criteria that EPA proposed will protect aquatic life from the deleterious effects of increased mean water temperature and from alterations in the amplitude and frequency of mean-high and mean-low water temperatures. EPA's recommended 304(a) criteria, on which the proposal is based, are designed to protect aquatic species from short- and long-term temperature anomalies, resulting in the maintenance of reproductive, recruitment, and growth cycles.

Dissolved Oxygen Criteria for Class A Waters throughout the State of Maine, Including in Indian Lands

On June 5, 2015, EPA disapproved Maine's dissolved oxygen (DO) criteria for Class A fresh waters, set forth in 38 M.R.S. § 465(2.B), for all waters in Maine, including waters in Indian lands. Maine's criteria state that "The dissolved oxygen content of Class A waters shall be not less than 7 parts per million or 75% of saturation, whichever is higher." Maine's DO criteria for Class A freshwaters are protective of all life stages of warmwater species and adult coldwater species, but are not high enough to protect the early life stages of coldwater species. EPA disapproved the criteria because they do not protect early life stages of coldwater species and, therefore, do not protect the full aquatic life designated use.

EPA proposed year-round DO criteria for Class A waters that are identical to Maine's existing criteria (not less than 7 mg/L or 75% of saturation, whichever is higher). Maine's year-round criteria are higher, and more protective than EPA's minimum DO recommendations for non-early life stages (USEPA 1986). EPA therefore proposed the same year-round criteria that Maine uses for these waters, in deference to Maine's determination of what is necessary to protect non-early life stages and to be consistent with Maine's criteria for Class B waters.

For fish spawning areas in Class A waters, during the period of October 1 through May 14, EPA proposed a 7-day mean DO concentration of ≥ 9.5 mg/L and a 1-day minimum of ≥ 8 mg/L. These proposed criteria to protect more sensitive early life stages of coldwater species are consistent with EPA's 304(a) criteria recommendations and will protect those stages against potentially damaging and lethal effects. EPA's proposed criteria for fish spawning areas for early life stages are also consistent with Maine's criteria for early life stages in Class B waters.

Mixing Zone Policy for Waters in Indian Lands

On June 5, 2015, EPA disapproved, for waters in Indian lands, Maine's mixing zone policy set forth in 38 M.R.S. § 451. This provision allows the DEP to establish mixing zones that would allow the "reasonable" opportunity for dilution or mixture of pollutants before the receiving waters would be evaluated for WQS compliance.

States are not required to adopt mixing zone policies into their WQS, but if they do, they are subject to EPA review and approval. 40 C.F.R. § 131.13. A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place, and where certain numeric criteria may be exceeded, but the designated uses of the waterbody as a whole must still be protected.

EPA's guidance includes specific recommendations that a state's mixing zone policy should include to ensure that mixing zones do not impair the designated uses of the waterbody as a whole. Among other things, the mixing zone policy must ensure that pollutant concentrations in the mixing zone are not lethal to organisms passing through and do not cause significant human health risks; and that mixing zones do not endanger critical areas such as breeding or spawning grounds, drinking water intakes and sources, shellfish beds, or endangered or threatened species habitat. Maine's mixing zone law does not contain any of these or other protective safeguards to ensure the protection of designated uses. The only specific limitation on mixing zones in Maine's mixing zone statute is that they be "reasonable." There are also no state regulations that define the boundaries of a "reasonable" mixing zone. Therefore EPA disapproved Maine's law for waters in Indian lands as being inadequate to protect designated uses.

EPA proposed, for waters in Indian lands, a mixing zone policy that retains Maine's statutory mixing zone language and expands upon it by 1) including specific information that a request for a mixing zone must contain, and 2) including minimum requirements that any mixing zone must satisfy in order to qualify for approval by DEP.

The proposed information requirements are intended to ensure that any discharger seeking DEP's approval of a mixing zone provides sufficient information for DEP to determine whether and to what extent a mixing zone may be authorized.

The proposed mixing zone minimum requirements are intended to ensure that any mixing zone approved by DEP will not interfere with or impair the designated uses of the waterbody as a whole. They are consistent with recommendations in EPA's Water Quality Standards Handbook (USEPA 2014). The proposed rule clarifies the extent to which water quality criteria may be exceeded in a mixing zone: chronic water quality criteria for those parameters approved by DEP may be exceeded within the mixing zone; acute water quality criteria may be exceeded for such parameters, but only within the zone of initial dilution inside the mixing zone, and the acute criteria must be met as close to the point of discharge as practicably attainable; and no water quality criteria may be exceeded outside of the boundary of a mixing zone as a result of the discharge for which the mixing zone was authorized. The proposed rule also specifies that a mixing zone must be as small as necessary, and that pollutant concentrations must be minimized and reflect the best practicable engineering design of the outfall to maximize initial mixing.

The proposal includes a requirement that mixing zones be established consistent with the methodologies in Section 4.3 and 4.4 of EPA's "Technical Support Document for Water Quality-based Toxics Control" EPA/505/2-90-001, dated March 1991. This requirement is consistent with EPA's recommendation that mixing zone policies describe the general procedures for defining and implementing mixing zones in terms of location, maximum size, shape, outfall design, and in-zone water quality, at a minimum (USEPA 2014). EPA also proposed a requirement that the mixing zone demonstration be based on the assumption that a pollutant does not degrade within the proposed mixing zone, unless a valid scientific study demonstrates otherwise. This assumption provides a conservative estimate of potential pollutant concentrations to be used when calculating allowable mixing zone discharges.

EPA proposed to prohibit the use of a mixing zone for bioaccumulative pollutants consistent with EPA's guidance that recommends that mixing zone policies not allow mixing zones for discharges of these pollutants in order to protect the designated uses. EPA adopted this approach for bioaccumulative pollutants in 2000 when it amended its 1995 Final Water Quality Guidance for the Great Lakes System at 40 C.F.R. part 132 to phase out mixing zones for existing discharges of bioaccumulative pollutants within the Great Lakes Basin and ban such mixing zones for new discharges within the Basin. Because fish tissue contamination tends to be a far-field problem affecting entire or downstream waterbodies rather than a near-field problem being confined to the area within a mixing zone, EPA has emphasized that it may be appropriate to restrict or eliminate mixing zones for bioaccumulative pollutants in certain situations such as where mixing zones may encroach on areas often used for fish harvesting, particularly for stationary species such as shellfish, and where there are uncertainties in the assimilative capacity of the waterbody.

The proposed rule also establishes a number of restrictions to protect designated uses, such as requirements that the mixing zone be unlikely to jeopardize the continued existence of any endangered or threatened species listed under section 4 of the Endangered Species Act or result in the destruction or adverse modification of such species' critical habitat; not extend to drinking water intakes or sources; not cause significant human health risks; not endanger critical areas such as breeding and spawning grounds, habitat for state-listed threatened or endangered species, areas with sensitive biota, shellfish beds, fisheries, and recreational areas; not result in lethality to mobile, migrating, and drifting organisms passing through or within the mixing zone; not overlap with another mixing zone; not attract aquatic life; and not result in any objectionable color, odor, taste, or turbidity.

Action Area

The Action Area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For purposes of this Section 7 consultation support document, the extent and location of the Action Area is defined based on the Atlantic salmon Gulf of Maine (GOM) Distinct Population Segment (DPS) and its Critical Habitat, Atlantic sturgeon GOM DPS and its proposed Critical Habitat, and estimated range of shortnose sturgeon, including documented spawning areas, relative to 1) the location of waters in Indian lands, and 2) the location of Class A waters.

Three figures are included in this BA, and corresponding maps are attached. They illustrate the location of reservation and trust lands and Class A waters relative to the each of the three species. Figure 1 and attached Map 1 depict the designated Atlantic salmon DPS and Critical Habitat. Figure 2 and attached Map 2 depict the proposed Critical Habitat for the Atlantic sturgeon GOM DPS. The estimated range of the Atlantic sturgeon is not delineated on the map, but we note that its range includes "All anadromous sturgeon that are spawned in the watersheds from the Maine/Canadian Border and extending southward to include all associated watersheds draining into the Gulf of Maine as far south as Chatham, MA as well as wherever these fish occur in coastal bays and estuaries and the marine environment." (77 FR 5880, 5991 February 6, 2012). Figure 3 and attached Map 3 depict the major rivers within the estimated range of the shortnose sturgeon. We note that its full estimated range for purposes of this action includes

Atlantic Ocean waters and associated bays, estuaries, and coastal river systems up to the first impassible barrier (e.g. a dam or fall), from Minas Basin, Nova Scotia, Canada to the southern extent of Maine's coastline. See GARFO Master ESA Species Table for Shortnose Sturgeon.

As with the proposed rule, when promulgated, the aquatic life criteria for ammonia, pH, and tidal temperature, and the mixing zone policy, will apply only to waters in Indian lands; and the dissolved oxygen criteria will apply to all Class A waters throughout Maine, including waters in Indian lands.

Listed Species, Distinct Population Segments and Critical Habitat Within the Action Area

There are two endangered and one threatened species of fish listed under the ESA that occur or have the potential to occur in the Action Area and may be affected by the proposed action. Also, there is designated Critical Habitat for the Atlantic salmon Gulf of Maine (GOM) Distinct Population Segment (DPS), and proposed Critical Habitat for the Atlantic sturgeon GOM DPS. Pertinent listing information for these species is identified in Tables 1-3 below:

Table 1. Atlantic Salmon (*Salmo salar*) Status - Endangered

Title	Federal Register	Date
Draft Recovery Plan for the Gulf of Maine DPS	81 FR 18639	3/31/2016
Final Rule to List the Expanded Gulf of Maine DPS as Endangered Under ESA	74 FR 29344	06/19/2009
Critical Habitat for the Gulf of Maine DPS	74 FR 29300	06/19/2009
Status Review for Anadromous Atlantic Salmon	71 FR 55431	09/22/2006
Recovery Plan for Gulf of Maine DPS	70 FR 75473	12/20/2005
ESA Listing Rule for Gulf of Maine DPS	65 FR 69459	11/17/2000

Table 2. Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) Status - Endangered

Title	Federal Register	Date
Interim 4(d) Rule for Protective Regulations for the Gulf of Maine DPS	78 FR 69310	11/19/2013
Final Listing Rule for Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon in the Northeast Region	77 FR 5880	02/06/2012
Proposed Designation of Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon	81 FR 35701	06/03/2016

Table 3. Shortnose Sturgeon (*Acipenser brevirostrum*) Status - Threatened

Title	Federal Register	Date
Twelve-Month Finding on a Petition to Identify and Delist a Saint John River DPS of Shortnose Sturgeon under the ESA	80 FR 65183	10/26/2015
Biological Assessment	N/A	11/2010
Recovery Plan	63 FR 69613	12/17/1998
ESA Listing Rule	32 FR 4001	03/11/1967

Indian Land Locations Relative to Atlantic Salmon GOM DPS and Critical Habitat, Atlantic Sturgeon GOM DPS and Proposed Critical Habitat, and the Estimated Range of Shortnose Sturgeon

For the WQS that will be promulgated only in waters in Indian lands, EPA determined the Action Areas for Atlantic salmon by using delineated GIS maps, with data provided by NMFS, illustrating the GOM DPS and Critical Habitat; and determined the Action Areas for Atlantic and shortnose sturgeon by using the Greater Atlantic Region Fisheries Office (GARFO) Master ESA Species Tables (July 11, 2016), and GIS mapping data for both the species of concern and mapped Indian lands. Action Areas occur in those places where GARFO Master Species Tables information and/or NOAA GIS data overlap with Indian lands. GARFO Master Species Tables are available at the following link:

http://www.greateratlantic.fisheries.noaa.gov/protected/section7/guidance/maps/index.html

GARFO Master ESA Species Tables provide a description of the general distribution of Atlantic salmon, and Atlantic and shortnose sturgeon. The general distributions describe the broad geographic ranges for ESA-listed species that can extend, for example, from as far north to Hamilton Inlet, Labrador, Canada to the south at Cape Canaveral, Florida for Atlantic Sturgeon. In addition, to assist action agencies when reviewing proposed actions and their potential effects on listed ESA species, the GARFO Master Species Tables list bodies of water that ESA-listed species are known to use, life stages present, whether it's being used for foraging, spawning, rearing, etc.

The Micmac and Maliseet tribes have a number of trust lands in northern Maine (see attached Maps). As illustrated in the attached map for Atlantic salmon, the Critical Habitat and GOM DPS for Atlantic salmon do not encompass these trust lands. Similarly, the Atlantic sturgeon GOM DPS and Proposed Critical Habitat, and the estimated range of shortnose sturgeon do not encompass these trust lands (see attached maps for Atlantic and shortnose sturgeons). Therefore, the Micmac and Maliseet trust lands are not considered an Action Area for the EPA's promulgation of the ammonia, pH, and tidal temperature criteria and the mixing zone policy.

The Penobscot Reservation and some of the Penobscot and Passamaquoddy tribes' trust lands fall within the Atlantic salmon GOM DPS and/or Critical Habitat (see Figure 1 and Map 1 and insets)[4]. Therefore, freshwaters within those Indian lands are within the Action Area relative to the Atlantic salmon for the promulgation of the ammonia and pH criteria and the mixing zone policy.

Based on information describing the general distribution range of Atlantic sturgeon in the final listing rule (77 FR 5880, February 2, 2012), and the GARFO Master Species Table, which identifies waters that the Atlantic sturgeon have been documented to use in the vicinity of the Passamaquoddy Reservation at Pleasant Point (Cobscook Bay/St. Croix River), EPA determined that the tidal waters at the Passamaquoddy Pleasant Point Reservation are within the Action Area for evaluating the potential effects of the promulgation of the tidal temperature criteria and the mixing zone policy on the Atlantic sturgeon.

Although the GARFO Master Species Table for shortnose sturgeon does not document their use of the waters at Pleasant Point, the general distribution range, as described on the GARFO Master Species Table, would encompass these waters. Furthermore, because shortnose sturgeon are known to use intertidal zones and exhibit interriver movements via marine habitats (Fernandes et al. 2010), they could potentially use the intertidal waters at the Pleasant Point Reservation. Therefore, the tidal waters at the Passamaquoddy Pleasant Point Reservation are within the Action Area for evaluating the potential effects of the promulgation of the tidal temperature criteria and the mixing zone policy on the shortnose sturgeon.

Finally, any Class A freshwaters in Maine (i.e., not limited to waters in Indian lands) that are within the Atlantic salmon GOM DPS and Critical Habitat, the estimated range of the Atlantic sturgeon GOM DPS and proposed Critical Habitat, and the estimated range of shortnose sturgeon throughout Maine, including in Indian lands, are considered within the Action Area for evaluating the potential effects of the promulgation of dissolved oxygen criteria on the three species. The Class A waters are shown on the referenced figures and maps.

Based on a review of the Class A designations for the waters within the estimated range and the GARFO Species Table for shortnose sturgeon, and the GARFO Species Table for Atlantic sturgeon and its proposed Critical Habitat, only one area was located for which the Class A DO criteria would apply. This area, which is relevant to adult shortnose sturgeon only, is located on the St. George River above Route 90 and below the first dam. In contrast with the sturgeon, there are multiple Class A waters within the Atlantic salmon GOM DPS and Critical Habitat, including spawning areas.

[4] The exact contours of the Penobscot and Passamaquoddy reservations and their waters are the subject of ongoing litigation or dispute. For purposes of this BA, EPA is taking a conservative approach to depict the widest scope of the reservations and hence the Action Areas.

The Action Areas are summarized as follows:

Species	Action Area	Promulgated WQS Applicable to the Action Area
Atlantic salmon	Penobscot Reservation; and the Penobscot and Passamaquoddy trust lands and Class A waterbodies that are within Atlantic salmon GOM DPS and Critical Habitat	Freshwater Ammonia Freshwater pH Mixing Zone Policy Dissolved Oxygen (Class A waters only)
Atlantic sturgeon	Passamaquoddy Reservation at Pleasant Point	Tidal Temperature Mixing Zone Policy
shortnose sturgeon	Passamaquoddy Reservation at Pleasant Point; and Class A waters in a portion of St. George River above Rte. 90	Tidal Temperature Mixing Zone Policy Dissolved Oxygen (Class A waters only)

Figure 1. Atlantic salmon GOM DPS and Critical Habitat Relative to Indian Lands

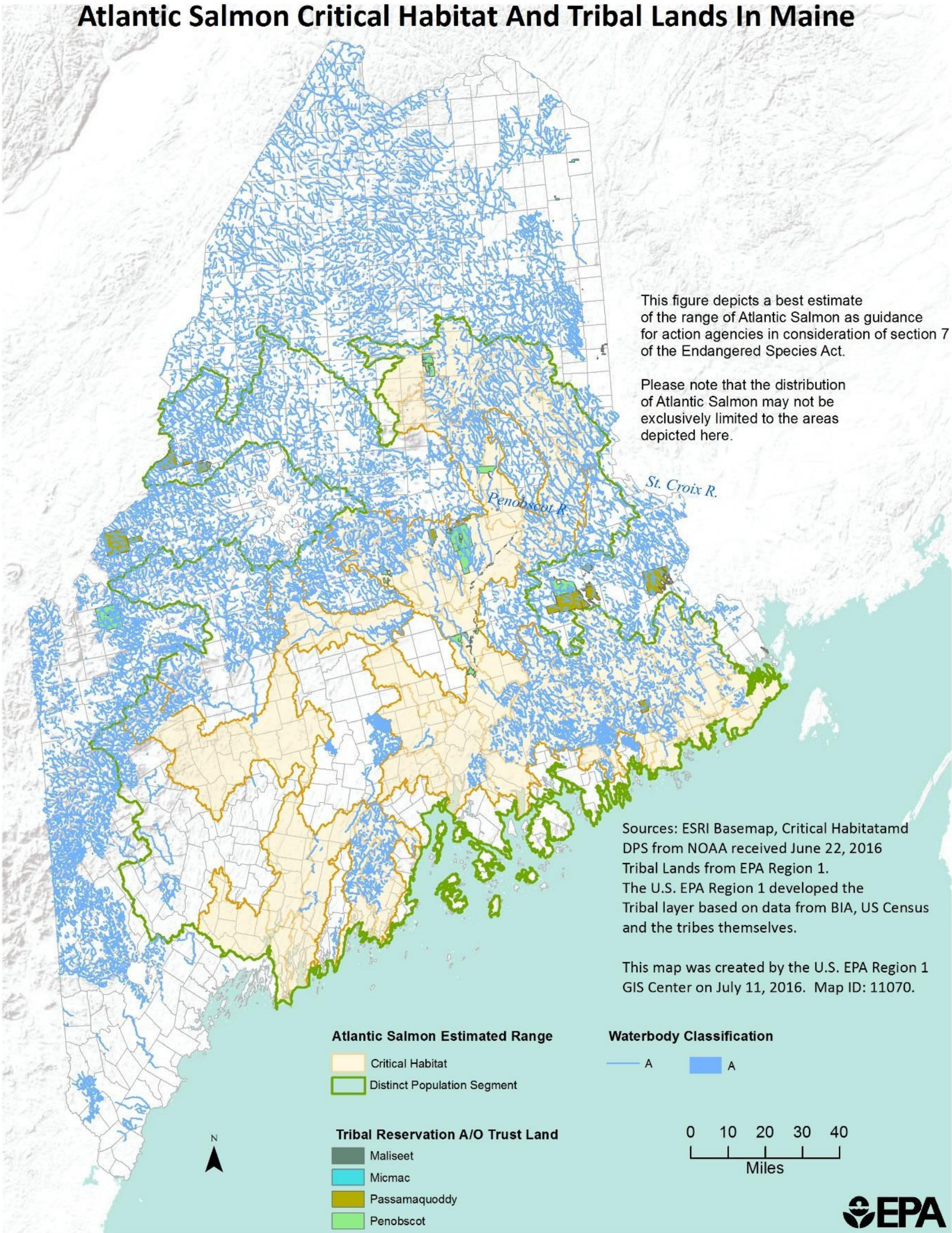


Figure 2. Atlantic Sturgeon GOM DPS and Proposed Critical Habitat Relative to Indian Lands

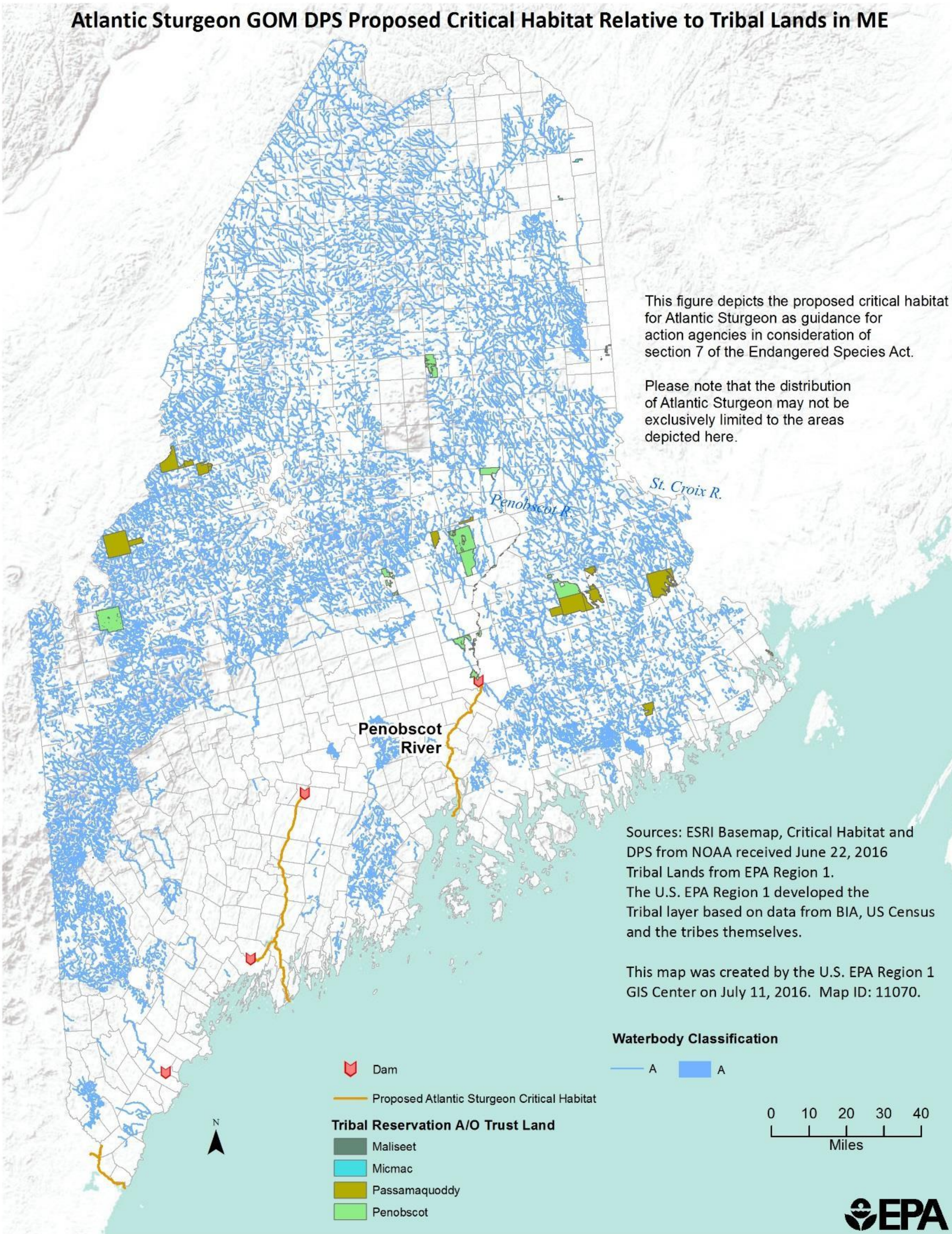
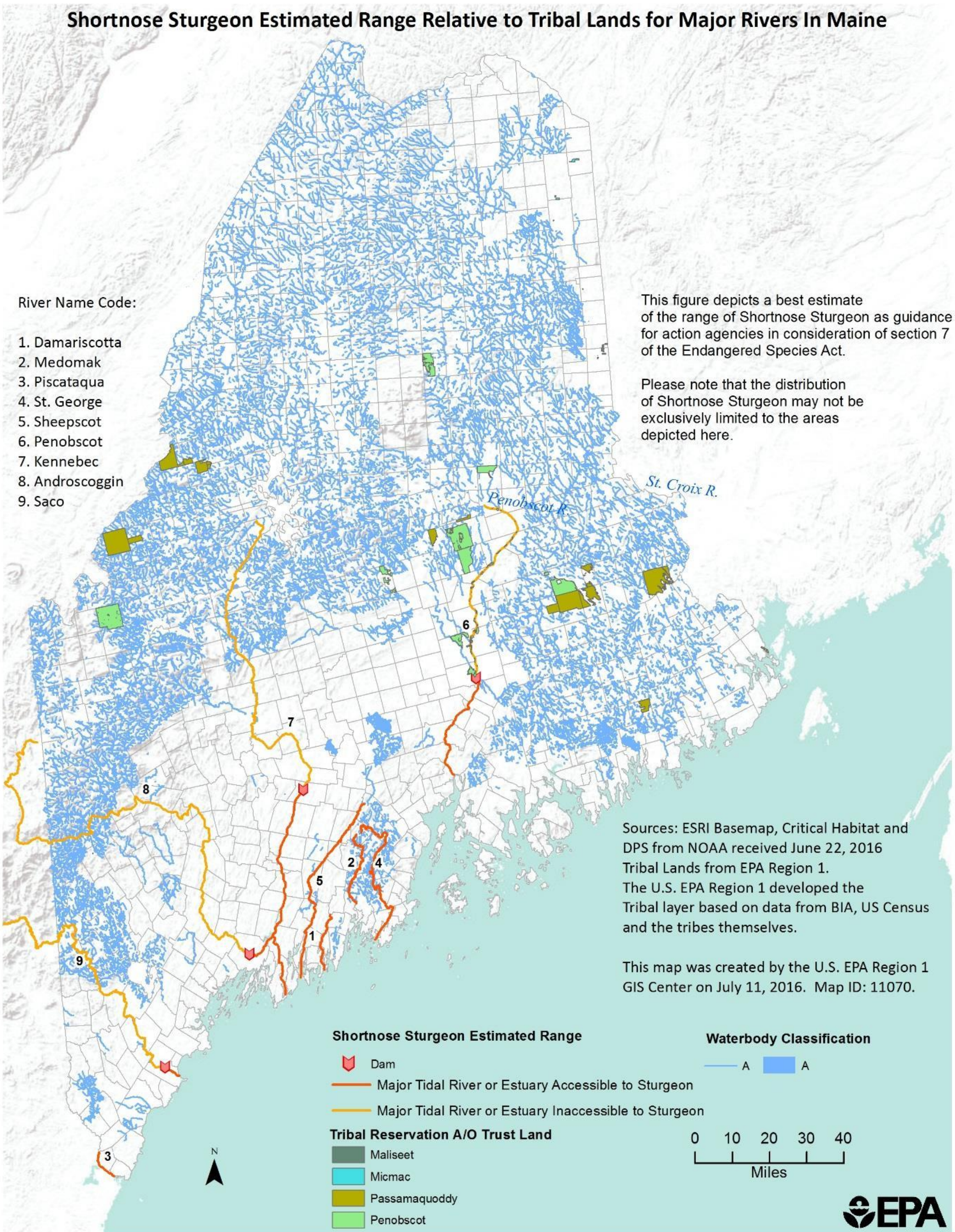


Figure 3. Estimated Range (for Major Rivers) of Shortnose Sturgeon Relative to Indian Lands



Effects Analysis

Ammonia Criteria for Fresh Waters in Indian Lands (Relevant to Atlantic Salmon)

As discussed above, EPA has proposed freshwater ammonia aquatic life criteria consistent with EPA's 2013 criteria recommendations (USEPA 2013), which reflect the latest scientific knowledge. Literature searches for laboratory toxicity tests of ammonia on freshwater aquatic life, published from 1985 to 2012, identified new studies containing acute and chronic toxicity data acceptable for criteria derivation. The acute criterion dataset includes 12 species of aquatic animals that are Federally-listed as threatened, endangered or species of concern. In the chronic criterion dataset for ammonia, Federally-listed species are represented by three salmonid fish species in the genus *Oncorhynchus*, including sockeye salmon, rainbow trout/steelhead, and the subspecies Lahontan cutthroat trout.

Maine's ammonia criteria that EPA disapproved were consistent with EPA's 1999 recommended aquatic life criteria for ammonia, which were based on the most sensitive endpoints known at the time. The acute criterion was based primarily on effects on salmonids (where present) or other fish, and the chronic criterion was based primarily on reproductive effects on the benthic invertebrate *Hyalella* or on survival and growth of fish early life stages (when present), depending on temperature and season.

The 2013 recommended criteria take into account data for several sensitive freshwater mussel species in the Family Unionidae that had not previously been tested. The 2013 criteria include additional data confirming the sensitivity of freshwater non-pulmonate snails. As noted in the 2013 document (USEPA 2013), approximately one-quarter of 300 freshwater unionid mussel taxa in the United States are Federally-listed as endangered or threatened species. Freshwater mussels are broadly distributed across the U.S., as are freshwater non-pulmonate snails, another sensitive invertebrate taxon, and both of these groups are now included in the ammonia dataset. The dataset used to derive the 2013 ammonia criteria magnitudes included some threatened or endangered species, and EPA noted that none were the most sensitive of the species tested (USEPA 2013). Overall, the 2013 freshwater acute and chronic aquatic life criteria for ammonia will more fully protect the aquatic community than previous criteria.

The ammonia criteria magnitude is affected by pH and temperature. For example, at pH of 7 and temperature of 20°C, the 2013 acute criterion magnitude is 17 mg TAN/L and the chronic criterion magnitude is 1.9 mg TAN/L. At this pH and temperature, the 2013 chronic criterion magnitude is 2.4-fold lower than the 1999 chronic criterion magnitude. The acute criterion duration represents a one-hour average. The chronic criterion duration represents a 30-day rolling average with the additional restriction that the highest 4-day average within the 30 days be no greater than 2.5 times the chronic criterion magnitude. These values are not to be exceeded more than once in 3 years on average.

Elevated ammonia levels in fish leads to labored respiration, convulsion, coma, and death. Toxicity in fish can either impair ammonia excretion or cause a net uptake of ammonia (Randall and Tsui 2002). Finn (2007) provides a review on the existing physiological and toxicological knowledge of salmonid eggs and larvae in relation to water quality. Among the effects discussed, Finn (2007) noted that excess ammonia penetration of developing embryo tissue could lead to teratogenic effects, or be detrimental to cell-to-cell signaling and formation of the central nervous system. At a molecular level, Kolarevic et al. (2012) were the first to report on the effects of long-term exposure (105 days) to ammonia on the genes encoding transport proteins for ammonia and urea. This study suggested that Atlantic salmon parr could adapt to long-term (sublethal) ammonia exposure by ammonia detoxification in the brain and an increased capacity for gill excretion of ammonia and urea provided through increased transcription of their transport proteins.

Knoph (1992) examined the acute toxicity of ammonia to Atlantic salmon parr and the results of 96 hour mean LC 50 were 319.1 mg TAN/L and 364.5 mg TAN/L at mean temperatures of 2.1°C and 17.1°C, respectively. EPA estimated the species mean acute value for ammonia toxicity in Atlantic salmon of 183.3 mg TAN/L, and a chronic toxicity value >30.64 mg TAN/L, both adjusted to pH7 (USEPA 2013). EPA's proposed criteria are well below these values.

Based on the studies and discussion above, EPA concludes that the proposed freshwater ammonia criteria may affect, but are not likely to adversely affect the Atlantic salmon.

pH Criterion for Fresh Waters in Indian Lands (Relevant to Atlantic Salmon)

Chronic and episodic acidified freshwater can negatively impact Atlantic salmon at all life stages (Kircheis and Liebich 2007). In addition, studies show that low pH combined with low aluminum concentrations are especially detrimental to Atlantic salmon smolts. Monette et al. (2008) demonstrated by direct comparison that smolts are more sensitive than parr to impacts of short-term exposure to low pH and moderate concentrations of inorganic aluminum. During this sensitive life stage low pH combined with available aluminum can impair smoltification and reduce seawater tolerance of smolts (Monette et. al. 2008; Kroglund and Staurnes 1999; Staurnes et. al. 1996). Berntssen et.al. (1997) observed no mortality of Atlantic salmon smolts held in pH 6.8, 6.0 and 6.2 at low aluminum concentrations (10, 17.5 and 11.5 ug labile Al/L, respectively), and that the addition of aluminum at pH 6.0 (23.5 mg labile Al/L) resulted in a LT50 of 36 hours. Results from Kroglund and Staurnes study (1999) demonstrated that moderately acidified water with low aluminum concentrations impairs smoltification and reduces seawater tolerance of Atlantic salmon smolts, and that, generally, pH values lower than 6.5 are suboptimal for Atlantic salmon smolts. In a comprehensive review of the consequences of acidification of lakes and streams in Norway and Northeast America, Haines (1981) reported various findings from studies and the apparent pH at which fish populations ceased reproducing, declined, or disappeared. For Atlantic salmon, that pH was 5.0 – 5.5. Peterson et al. (1980) found that hatching Atlantic salmon eggs was delayed or prevented in water with low pH (4.0 – 5.5). However, hatching could be induced by returning eggs to normal pH conditions (6.6 – 6.8). Although many of the studies reviewed occurred in Norway, studies by Magee et.al. (2001 and 2003) in Maine rivers resulted in similar findings. Table 2 of the May 13, 2015 NMFS letter to EPA (NMFS 2015) provides information on Primary Constituent Elements (PCEs) required by Atlantic salmon. According to the Table, the pH for fully functioning adult salmon spawning should be greater than 5.5, while the pH for fully functioning salmon embryo and fry development should be greater than 6.0.

Magee et al. (2001), examined the effects of acid water and aluminum on the physiological and migratory behavior of Atlantic salmon wild and hatchery smolts in the Narraguagus River, Maine. Overall, wild smolts exposed to acid, aluminum enriched (pH range 5.0-5.5, Al 150-200 ug/L) river water were less able to osmoregulate than hatchery smolts upon entering saltwater, despite having higher gill Na^+/K^+ ATPase activities. Magee et al. (2003) later investigated the effect of episodic acidification on Atlantic salmon smolt physiology and survival in freshwater and seawater. Results of this study demonstrated that episodes of increased acidity, average pH levels of 5.93 (*n*=15)] and aluminum (total dissolved Al concentrations 216 ug/L and 107 ug/L) in freshwater leads to suppression of gill Na^+,K^+-ATPase activity, and subsequent reduction in hypo-osmotic capability and survival in saltwater.

EPA has proposed a freshwater pH criterion range of 6.5 to 8.5. Based on the studies discussed, the proposed pH criterion 6.5 to 8.5 for freshwaters in Indian lands will be protective of Atlantic salmon. EPA concludes that the proposed pH criterion may affect, but is not likely to adversely affect the Atlantic salmon and its Critical Habitat.

Temperature Criteria for Tidal Waters in Indian Lands (Relevant to Atlantic and Shortnose Sturgeon)

As noted earlier, EPA disapproved the tidal temperature criteria because the 4° F temperature rise provision and the maximum temperature criterion of 85° F are not protective of indigenous species associated with tidal waters – specifically, the intertidal zone -- in the vicinity of Pleasant Point. Here, typical temperatures are in the 37°–52° F range based on the nearest NOAA monitoring station at Eastport, Maine.

EPA has proposed a summer weekly maximum temperature of 18°C (64.4°F), and a maximum increase in the weekly average baseline ambient temperature resulting from artificial sources of 1° C (1.8° F) during all seasons of the year, provided that the summer maximum temperature is not exceeded.

Because the proposed temperature criteria are only for tidal waters in Indian lands, the scope of this discussion is limited to those life stages expected to occur within the Action Area of the Passamaquoddy Reservation at Pleasant Point. The Atlantic salmon GOM DPS and Critical Habitat are outside this Action Area. Therefore, EPA did not evaluate potential effects of the tidal temperature criteria on the Atlantic salmon.

Although the GARFO Master Species Table for shortnose sturgeon does not include documentation that these sturgeon use the Pleasant Point Action Area, the general distribution as defined on the GARFO Table would encompass it. Furthermore, because shortnose sturgeon are known to use intertidal zones, and exhibit inter-river movements via marine habitats (Fernandes et al. 2010), they could potentially use the Pleasant Point Action Area. Therefore, EPA evaluated the potential effects of the proposed tidal temperature criteria on shortnose sturgeon for the Pleasant Point Action Area.

EPA also evaluated the potential effects of tidal temperatures on Atlantic sturgeon in the Pleasant Point Action Area because, based on the GARFO Master Species Table for Atlantic sturgeon, they have been documented to use the waters in the vicinity of the Passamaquoddy Reservation at Pleasant Point (Cobscook Bay/St. Croix River).

According to the GARFO Master Species Tables, only sub-adult and adult Atlantic sturgeon use marine waters, and only adult shortnose sturgeon use marine waters. Although EPA recognizes that the effects analysis should be focused on these life stages, the studies reviewed for this BA related to Atlantic and shortnose sturgeon and temperature effects were limited to the Young-of-Year (YOY) life stage because EPA was unable to locate similar studies on later life stages. The likely reason that studies focus on YOY is because earlier life stages are more vulnerable to the effects of temperature.

Temperature is one factor that affects Atlantic and shortnose sturgeon on broad geographic and local scales to even smaller physiological and developmental scales. Temperature has been shown to be a likely factor in habitat selection by Atlantic and shortnose sturgeon (Niklitschek and Secor 2010) and seasonal distribution and movement of Atlantic and shortnose sturgeon in the Penobscot River Estuary in Maine (Fernandes et al. 2010). Fernandes et al. (2010) examined the distribution and movements of shortnose and Atlantic sturgeon in the Penobscot River estuary in Maine. This study found that shortnose sturgeon were present year round in the estuary, overwintered fall to spring in the upper estuary, and moved down stream to the middle estuary in early spring. Atlantic sturgeon were found to move into the estuary from the ocean in the summer and concentrated in a 1.5 km reach. Fernandes et al. (2010) also found that shortnose sturgeon moved upstream to the upper part of the estuary during mid- to late July, when river flow was at its lowest and mean daily river temperature increased from 23˚C to its annual peak 27.6˚C.

Secor and Gunderson (1998) examined the effects of hypoxia and temperature on the survival, growth and respiration of juvenile Atlantic sturgeon. Under high temperature hypoxic conditions they found that YOY survival at a temperature of 26 ° C was substantially lower (6.3% survival) than YOY at 19 ° C (73% survival). They found that absolute growth (weight) was affected by temperature, access to the surface, surface access in combination with temperature interaction, and by oxygen level. Additionally, Secor and Gunderson (1998) found that absolute growth rate was inversely related to temperature.

The temperature LC50 (48 hours) for YOY shortnose sturgeon ranged from 28.2 ° C to 30.7 ° C (Ziegeweid et.al. 2008). Thermal maxima were determined in another study by Ziegeweid et al. (2008a). They found the critical and lethal thermal maxima for YOY shortnose sturgeon (acclimated to 19.5 ^{O}C and 24.1 ^{O}C) ranged between 33.7 ° C ($\pm$0.3) - 35.1 ° C ($\pm$0.2), and 34.8 ° C ($\pm$0.1) – 36.1 ° C ($\pm$0.1), respectively.

Based on these studies, and because YOY are more sensitive than subadults and adults to temperature, we conclude that the summer weekly maximum temperature criterion of 18°C will be protective of the sub-adult and adult life stages of Atlantic and shortnose sturgeon.

Regarding the proposed maximum increase of 1° C (1.8° F) in the weekly average baseline temperature resulting from artificial sources, studies such as Ziegeweid et al. (2008), where shortnose sturgeon YOY were acclimated to specified temperatures and then exposed to rising temperatures, can be helpful in examining this aspect of the proposed tidal temperature criteria. However, these types of studies are limited in number, especially for shortnose and Atlantic sturgeon at the northern extent of their range.

Ziegeweid et al. (2008) found that critical thermal maxima increased significantly with an increase in acclimation temperature (p<0.0001). In particular, lethal thermal maxima increased to 34.8° C and 36.1° C for shortnose sturgeon already acclimated to 19.5° C and 24.1° C, respectively. Although this study was based on shortnose sturgeon in the southeast, it demonstrates that shortnose sturgeon can tolerate some increase from (acclimated) baseline temperatures beyond a 1° C rise.

Shortnose and Atlantic sturgeon that may be in the Action Area of Passamaquoddy Reservation at Pleasant Point are subjected to a large tidal range (20 feet +) and as such are exposed to a wide range of temperatures on a daily basis, especially in the summer. Therefore, limiting the proposed increase in average baseline ambient temperature to 1°C with the additional safeguard of a summer weekly maximum of 18°C is not likely to adversely affect Atlantic and Shortnose sturgeon in the Action Area.

Based on the studies reviewed, EPA concludes that the proposed temperature criteria may affect, but are not likely to adversely affect, Atlantic and shortnose sturgeon in the Pleasant Point Action Area.

Dissolved Oxygen Criteria for Class A Waters throughout the State of Maine, Including in Indian Lands (Relevant to Atlantic Salmon and Shortnose Sturgeon)

As noted, EPA disapproved Maine's dissolved oxygen (DO) criteria for Class A waters because they are not high enough to protect the early life stages of coldwater species (including salmonid spawning), Therefore, EPA proposed dissolved oxygen criteria (7-day mean of ≥ 9.5 mg/L and 1-day minimum of ≥ 8 mg/L) from October 1 through May 14 in fish spawning areas to protect the early life stages and spawning for cold waters species. Additionally, EPA proposed year-round DO criteria for Class A waters that are identical to Maine's existing criteria (not less than 7 mg/L or 75% of saturation, whichever is higher) because Maine's criteria are higher and more protective than EPA's minimum DO recommendations for non-early life stages (USEPA 1986).

Based on a review of the Class A designations for the waters within the estimated range and the GARFO Species Table for shortnose sturgeon, and the GARFO Species Table for Atlantic sturgeon and its proposed Critical Habitat, EPA located only one area within the species' ranges in Maine to which the Class A DO criteria would apply. This area, relevant to adult shortnose sturgeon only, is located in the St. George River above Route 90 and below the first dam. There are no Atlantic sturgeon, and no shortnose sturgeon spawning areas, in Class A waters in Maine. Therefore the analysis below focusses only on the effects of the proposed year round DO criteria on adult shortnose sturgeon, and not on the effects of the proposed criteria for spawning areas.

In contrast with the sturgeon, there are multiple Class A waters within the Atlantic salmon GOM DPS and Critical Habitat, including spawning areas. Therefore, the analysis of the effects of the proposed DO for Class A waters on Atlantic salmon includes effects on early life stages as well as adults.

Shortnose Sturgeon

Sturgeons are unusually sensitive to oxygen deficiency (Cech and Doroshov 2004; Klyashtorin 1976; Secor and Gunderson 1998; Secor and Niklitschek 2001). One reason for this sensitivity has been attributed to their limited ability to oxyregulate at low DO levels (Klyashtorin 1976; Secor and Niklitschek 2001). There is recognition that degraded water quality, especially waters with low dissolved oxygen, is a concern for shortnose sturgeons in the southeast (Collins et al. 2000; Shortnose Sturgeon Status Review Team 2010).

Similar to EPA's evaluation of temperature effects on sturgeon, the studies EPA evaluated for DO effects on shortnose sturgeon were limited to the YOY life stage because EPA was unable to locate similar studies on later life stages. Again, the likely reason that DO studies focus on YOY is because earlier life stages are more vulnerable to the effects of suboptimal DO.

In a review of the effects of oxygen deficiency on shortnose and Atlantic sturgeon survival, Secor and Niklitschek (2001) reported that YOY juveniles experience lost production in a range of 4.3 – 4.7 mg/L DO at temperatures ranging between 22-27°C. Acute and chronic lethal effects for YOY shortnose and Atlantic sturgeon were observed for DO concentrations <3.3 mg/L at summertime temperatures (Secor and Niklitschek 2001).

Niklitschek and Secor (2010) reported on the behavioral responses of YOY shortnose and Atlantic sturgeon to discriminate and select between different combinations of temperature, DO and salinity. Overall, they selected oxygen saturation levels of >70%. The tolerance of cultured shortnose sturgeon juveniles exposed to different DO concentrations was examined by Jenkins et al. (1993). The majority of the tests were conducted in freshwater, and young fish were found to have higher mortality rates than older fish at DO concentrations of 3.0 mg/L. Similarly, Campbell and Goodman (2004) demonstrated that juvenile shortnose sturgeon (up to 134 days old) are sensitive to low DO in acute tests (at low salinities); median LC 50 values (24 hours) ranged between 2.2 to 3.1 mg/L.

As noted above, the proposed DO criteria include a minimum DO of ≥ 7 mg/L or 75% saturation, whichever is higher, which applies year-round to Class A waters that are not spawning areas, as well as to the Class A spawning areas from May 15 through September 30. The study by Niklitschek and Secor (2010) discussed above notes that YOY shortnose sturgeon selected oxygen saturation levels of >70%. Because the proposed DO criteria of 75% saturation is above the preferred DO in Niklitschek and Secor (2010) study, the minimum DO of ≥ 7 mg/L is above those DO concentrations at which growth and lethal impacts are observed in studies discussed above, and YOY are more sensitive than adults, EPA concludes that these DO criteria will be protective of the adult shortnose sturgeon.

Therefore, EPA concludes that the proposed dissolved oxygen criteria for Class A waters may affect, but are not likely to adversely affect the shortnose sturgeon.

Atlantic Salmon

Dissolved oxygen is an important environmental factor for each life stage of salmonids (Spence et al. 1996), and has been shown to be critical for optimal growth and health of Atlantic salmon (Novak 2014). In a review by Louhi et al. (2008), hatching salmonid eggs were found to require much higher oxygen concentrations (>7.0 mg/L) than early eggs (0.8 mg/L). Gibson (1993) suggests that intragravel dissolved oxygen should not fall below 5 mg/L during egg incubation. Pauwels and Haines (1994) tested a method to evaluate the survival of Atlantic salmon embryos for the period between egg deposition and alevin emergence from three streambeds in Maine. Dissolved oxygen concentrations in water collected within redds always exceeded 11 mg/L, and DO values were very similar to those measured in stream water. As cited by Crisp (1996), Turnpenny and Williams (1980) found that the percent survival of eggs relative to DO concentration at 4.8 mg/L, 6.5 mg/L and 8.0 mg/L was 0%, 50% and 100%, respectively. In a field study assessing oxygen supply to incubating Atlantic salmon embryos, Greig et al. (2007) proposed a set of threshold habitat values based on recorded mean survival rates. Low habitat quality equates to 5% survival at DO concentration of 0-6 mg/l; Intermediate habitat quality equates to 25% survival rate at DO concentration range of 6-9 mg/L and; High habitat quality equates to 70% survival rate at DO concentrations of >9 mg/L. For smolts suddenly exposed to low constant DO concentrations in a laboratory setting, the 3-day LC50 was approximately 3 mg/L in freshwater (Alabaster et al. 1979).

Kircheis and Liebich (2007) reviewed the habitat requirements for Atlantic salmon and provided minimum survival tolerance of embryos relative to DO concentrations as being: early development 1.14 mg/L, mature embryos 5.9 mg/L and 8 mg/l for alevins (McLaughlin and Knight 1987 as cited by Kircheis and Liebich 2007).

As noted above, for fish spawning areas in Class A waters, during the period of October 1 through May 14, EPA proposed a 7-day mean dissolved oxygen concentration of ≥ 9.5 mg/L and a 1-day minimum of ≥ 8 mg/L. Based on the studies reviewed, the proposed dissolved oxygen criteria for the 7-day mean and 1-day minimum are protective of early life stages of Atlantic salmon.

The proposed DO criteria also include a minimum DO of ≥ 7 mg/L or 75% saturation, whichever is higher, that applies year-round to Class A waters that are not spawning areas, as well as to the Class A spawning areas outside of the spawning period (i.e., from May 15 through September 30).

As noted by NOAA (2009), oxygen consumption by Atlantic Salmon parr is a function of temperature. In particular,

> *As temperature increases, the demand for oxygen increases (Decola, 1970). Parr require highly oxygenated waters to support their active feeding strategy. Though salmon parr can tolerate oxygen levels below 6mg/l, both swimming activity and growth rates are restricted.*

Also, according to NMFS's matrix of Primary Constituent Elements and essential features for assessing the status of Atlantic salmon Critical Habitat within an Action Area, year-round conditions for Atlantic salmon parr are expected to be fully functioning at DO concentrations of >6 mg/L (NMFS 2015). Based on this information, the proposed year-round dissolved oxygen criteria are protective of the later life stages of Atlantic salmon.

For the reasons discussed above, EPA concludes that the proposed dissolved oxygen criteria for Class A waters may affect, but are not likely to adversely affect the Atlantic salmon and its Critical Habitat.

Mixing Zone Policy for Waters in Indian Lands

The proposed mixing zone policy for waters in Indian lands specifies several requirements to ensure that detrimental effects to aquatic life are minimized to protect aquatic life. Additionally, the proposed rule establishes a number of restrictions to protect designated uses, including, but not limited to, requirements that no mixing zones be allowed for bioaccumulative pollutants, and that the mixing zone be unlikely to jeopardize the continued existence of any endangered or threatened species listed under section 4 of the Endangered Species Act or result in the destruction or adverse modification of such species' critical habitat; not endanger critical areas such as breeding and spawning grounds, habitat for state-listed threatened or endangered species, areas with sensitive biota, shellfish beds, fisheries, and recreational areas; not result in lethality to mobile, migrating, and drifting organisms passing through or within the mixing zone; and not attract aquatic life.

EPA concludes that the proposed mixing zone policy for waters in Indian lands may affect, but is not likely to adversely affect Atlantic salmon and their Critical Habitat, Atlantic sturgeon and its proposed Critical Habitat, and shortnose sturgeon.

Determination of Effects

Promulgation of the proposed WQS may affect, but will not adversely affect, the listed species and associated critical habitat. The WQS are based on the latest scientific data and will be a beneficial step towards the protection of all aquatic life and their habitats, including Atlantic salmon and its Critical Habitat, Atlantic sturgeon and its proposed Critical Habitat and shortnose sturgeon. EPA requests your concurrence with this determination.

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